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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/607,789	06/30/2000	Kyeong-Jun Kim	678-506 (P9382)	1168

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EXAMINER

CHOW, CHARLES CHIANG

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 01/14/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/607,789

Applicant(s)

KIM ET AL.

Examiner

Charles Chow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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**Office Action for
Applicant's Amendment
Received on 10/06/2003**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei (US 5,585,807) in view of Saldell (US 5,661,495), and further in view of Phillips et al. (US 5,572,223).

Regarding **claim 1**, Takei discloses a portable radio terminal apparatus including a terminal body and an antenna (small portable mobile terminal, abstract, col. 1, lines 11-20), wherein the portable radio terminal's overall length is less than $\frac{1}{2}$ wavelength (the portable mobile terminal has overall length under $\frac{1}{4}$ wavelength in col. 1, lines 6-9). Takei discloses a small antenna, figure in cover page, for improving the signal loss using step conductor, strip conductor, finite ground (col. 2, lines 41-45, and his claims 1-5).

Takei does not clearly indicate the conductor, the printed circuit board, within portable radio terminal, such that the electrical length, of the portable radio terminal, is $\frac{1}{2}$ wavelength.

Saldell teaches a conductor and a printed circuit board disposed within the terminal body such that an electrical equivalent length of the portable radio terminal is $\frac{1}{2}$ wavelength

(figure in cover page, abstract, a small size portable equipment, having quarter wavelength

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$1/4\lambda$ antenna radiator 1 and conductor 21 on board 20 in Fig. 3/Fig. 4). The conductor 21 is within the housing of the portable equipment. Saldell teaches the small quarter wavelength antenna could be functioning (col. 2, lines 8-30), by using the extended mirror current in conductor 21 on the tune ground plane, such that the antenna's electrical wavelength could be extended by the conductor 21. Saldell teaches the tune ground plane could be a flexible board or a conductive pattern integrated in the chassis or a circuit board for extending the antenna mirror current (col. lines 46-53; col. 4, line 62 to col. 5, line 7). Saldell teaches $1/4\lambda$ antenna and the extended mirror current in the tune ground conductor 21, to Takei's small terminal of $1/4\lambda$ size, such that the antenna could be functioning by directing the mirror current to the extended conductor 21, for the equivalent antenna electrical length of $1/2$ wavelength. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify and include Saldell's $1/4\lambda$ antenna and the extended mirror current in conductor 21, to Takei's small terminal of $1/4\lambda$ size, such that the $1/4\lambda$ antenna could be functioning by directing the mirror current to the extended conductor 21, for a equivalent antenna electrical length of $1/2$ wavelength. Regarding the amended portion for the thereby dispersing of the peak current distribution point, Saldell has taught the a circuit board for extending the antenna mirror current (col. 2, lines 45-53, col. 4, line 62 to col. 5, line 7), such that the peak current is inherently dispersed from the additional conductor. Therefore, the claims 1-10 are remaining in the rejection manner.

In the above, it does not clearly indicate the conductor connected to the printed circuit board.

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Phillips teaches the conductor connected to the printed circuit board for high antenna performance (In Fig. 23, the patch radiator 1601 is a conductor which is connected to the board 314 through ground pins 1969, at the ground plane 1666; col. 8, lines 41-43; col. 8, line 62 to col. 9, line 9). Phillips teaches the different shaped parasitic radiators (Fig. 7-12) which couples to the flap antenna for high antenna performance for a small pocket size antenna (abstract, col. 1, lines 26-31; col. 1, line 65 to col. 2, line 2; col. 7, lines 36-52; col. 3, lines 29-43; and in his claim 1). Phillips teaches the technique for high performance small antenna having parasitic radiator connected to board 314, such that the antenna performance could be improved with parasitic radiator. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify and include Phillips' parasitic radiator connected to the board, to Takei as modified above, such that the antenna performance could be improved with parasitic radiator.

Regarding **claim 2**, Saldell has taught above the flat conductive board (col. 2, lines 46-53, col. 4, line 62 to col. 5, line 7).

Regarding **claim 3**, Phillips has taught above in claim 1, as shown in Fig. 21, 22, the parasitic radiator 1668 is a thin conductive element on the dielectric 1667 having ground plane 1666 (col. 8, lines 39-54). The thin conductive element on the dielectric layer having ground is applicant's claimed strip line.

Regarding **claim 4**, Phillips has shown above in claim 1, the conductor extending in a straight line from board 314 via ground pins 1969, as shown in Fig. 23, the quarter wavelength parasitic patch radiator 1601 which is a straight line. Phillips also shown the straight line in Fig. 19, Fig. 20.

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Regarding **claim 5**, Phillips has taught above in claim 1, the closed loop conductor 1200 in Fig. 12, col. 7, lines 36-52.

2. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takei in view of Phillips, and further in view of Chatzipetros (US 5,554,996).

Takei and Phillip do not clearly teach the conductor integrated with the flip.

Regarding **claim 6**, Chatzipetros teaches the conductor (parasitic radiation 116) is integrated with the flip for providing antenna diversity (flap 104, figure in cover page, abstract).

Chatzipetros teaches the parasitic 116, in flap 104, is inductively coupled to second antenna 202 (col. 2, line 62 to col. 3, line 4) for a small handset (co. 1, lines 12-15) for easy assembling and low cost (col. 1, lines 41-48; col. 2, lines 34-40; col. 2, line 62 to col. 67).

Chatzipetros teaches the parasitic radiator for providing antenna diversity when flap is either open or closed, such that a handset could be upgraded of having the antenna diversity by using Chatzipetros's parasitic radiator in the flap. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify and include Chatzipetros's parasitic radiator for providing antenna diversity, to Takei as modified above, such that a handset could be upgraded of having the antenna diversity by using Chatzipetros's parasitic radiator in the flap. Regarding the equivalent electrical length formed by terminal body, the antenna and the flip is longer than $\frac{1}{4}$ wavelength thereby dispersing a peak current distribution point, Phillips has shown above in claim 1, in Fig. 10, the L-shaped parasitic radiator 1070, 1072, having one wavelength for coupling the high, maximum, antenna

current, such that the peak current is dispersed by coupling distribution to the parasitic radiator 1070, 1072.

Regarding **claim 7**, referring to the examiner's comment in claim 6 above, Chatzipetros has shown above the conductive is inserted within a flap, by imbedding the conductive material into the plastic flap 104 (col. 2, lines 34-40).

Regarding **claim 8**, referring to the examiner's comment in claim 6 above, Chatzipetros has shown above the conductive paint for the parasitic radiator 116 (col. 2, lines 62-67) for applicant's claimed conductive pigments.

Regarding **claim 9**, Chatzipetros has shown above the parasitic radiator 116 is a conductive copper sticker tape to flap 104 (col. 2, lines 62-67).

Regarding **claim 10**, Chatzipetros teaches the conductor (parasitic radiation 116) is integrated with the flap for providing antenna diversity (flap 104, figure in cover page, abstract).

Chatzipetros teaches the parasitic 116, in flap 104, is inductively coupled to second antenna 202 (col. 2, line 62 to col. 3, line 4) for a small handset (co. 1, lines 12-15) for easy assembling and low cost (col. 1, lines 41-48; col. 2, lines 34-40; col. 2, line 62 to col. 67).

Chatzipetros teaches the parasitic radiator for providing antenna diversity when flap is either open or closed, such that a handset could be upgraded of having the antenna diversity by using Chatzipetros's parasitic radiator in the flap. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify and include Chatzipetros's parasitic radiator for providing antenna diversity, to Takei as modified above, such that a handset could be upgraded of having the antenna diversity by using Chatzipetros's parasitic radiator in the flap. Regarding the equivalent electrical length formed by terminal body, the

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antenna and the flip is longer than $\frac{1}{4}$ wavelength thereby dispersing a peak current distribution point, Phillips has shown above in claim 1, in Fig. 10, the L-shaped parasitic radiator 1070, 1072, having one wavelength for coupling the high, maximum, antenna current, such that the peak current is dispersed by coupling distribution to the parasitic radiator 1070, 1072.

Response to Arguments

3. Applicant's arguments filed 10/06/2003 have been fully considered but they are not persuasive.

Regarding applicant's argument based upon the no teachings for dispersing an antenna peak current distribution point by adding a conductor, Saldell has taught the a circuit board for extending the antenna mirror current (col. 2, lines 45-53, col. 4, line 62 to col. 5, line 7), such that the peak current is inherently dispersed from the additional conductor. Therefore, the claims 1-10 are remaining in the rejection manner.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231


or faxed to: (703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow C, C.

December 29, 2003.


EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600